Lista Extra 4

Exercício de Variável Bidimensional Discreta Independente 30/09/2022

Considere a distribuição conjunta (X ,Y) dada por:

Y	X			$\mathbb{P}$(Y = y)
	-1	0	1	
-1	$\frac{1}{12}$			
0				$\frac{1}{3}$
1	$\frac{1}{4}$		$\frac{1}{4}$	
$\mathbb{P}$(X = x)				1

a) Sabendo que X e Y são independentes, complete a tabela da distribuição de probabilidade.

Y	X			$\mathbb{P}$(Y = y)
	-1	0	1	
-1	$\frac{1}{12}$	x	t	c
0	u	y	v	$\frac{1}{3}$
1	$\frac{1}{4}$	z	$\frac{1}{4}$	d
$\mathbb{P}$(X = x)	a	b	a	1

$$\frac{1}{12} + u + \frac{1}{4} = a$$

$$\frac{1}{12} + \frac{1}{3} * a + \frac{1}{4} = a$$

$$\frac{2a}{3} = \frac{4}{12}$$

$$a = \frac{2}{4} = \frac{1}{2}$$

$$\text{u} = \frac{1}{3} * a$$

$$\text{u} = \frac{1}{3} * \frac{1}{2} = \frac{1}{6}$$

$$\text{v} = \frac{1}{3} * a$$

$$\text{v} = \frac{1}{3} * \frac{1}{2} = \frac{1}{6}$$

$$\text{t} = \text{c} * \text{a}$$

$$\text{t} = \frac{1}{6} * \frac{1}{2} = \frac{1}{12}$$

$$\text{a} + \text{b} + \text{a} = 1$$

$$\frac{1}{2} + b + \frac{1}{2} = 1$$

$$b = 1 - \frac{2}{2} = 1 - 1 = 0$$

$$\text{a} * \text{d} = \frac{1}{4}$$

$$\frac{1}{2} * \text{d} = \frac{1}{4}$$

$$\text{d} = \frac{1}{4} * \frac{2}{1} = \frac{2}{4} = \frac{1}{2}$$

$$\text{c} + \frac{1}{3} + d = 1$$

$$\text{c} + \frac{1}{3} + \frac{1}{2} = 1$$

$$\text{c} = 1 \text{ - } \frac{5}{6} = \frac{1}{6}$$

$$\text{c} = \frac{1}{12} + x + t$$

$$\frac{1}{6} = \frac{1}{12} + x + \frac{1}{12}$$

$$x = \frac{1}{6} - \frac{2}{12} = \frac{1}{6} - \frac{1}{6} = 0$$

$$\frac{1}{3} = u + y + v$$
$$\frac{1}{3} = \frac{1}{6} + y + \frac{1}{6}$$
$$y = \frac{1}{3} - \frac{2}{6} = \frac{1}{3} - \frac{1}{3} = 0$$

$$\mathrm{d} = \frac{1}{4} + z + \frac{1}{4}$$
$$\frac{1}{2} = \frac{2}{4} + z$$
$$z = \frac{1}{2} - \frac{1}{2} = 0$$

Y	X			$\mathbb{P}(\mathrm{Y} = \mathrm{y})$
	-1	0	1	
-1	$\frac{1}{12}$	0	$\frac{1}{12}$	$\frac{1}{6}$
0	$\frac{1}{6}$	0	$\frac{1}{6}$	$\frac{1}{3}$
1	$\frac{1}{4}$	0	$\frac{1}{4}$	$\frac{1}{2}$
$\mathbb{P}(\mathrm{X} = \mathrm{x})$	$\frac{1}{2}$	0	$\frac{1}{2}$	1

b)Encontre $\mathrm{E}(\mathrm{X} \mid \mathrm{Y} = 0)$

X	$\mathrm{E}(\mathrm{X} \mid \mathrm{Y} = 0)$
-1	$0 * 0 = 0$
0	$0 * 0 = 0$
1	$0 * 0 = 0$

$$\mathrm{E}(\mathrm{X} \mid \mathrm{Y} = 0) = 0$$